User Guide

Fiber Optics

FOX Tx/Rx AV

Fiber Optic Extender

Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

68-1466-01 **Rev. B**
11 10

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, **click here**.

Notational Conventions Used in this Guide

TIP: A tip provides a suggestion to make setting up or working with the device easier.

NOTE: A note draws attention to important information.

CAUTION: A caution warns of things or actions that might damage the equipment.

WARNING: A warning warns of things or actions that might cause injury, death, or other severe consequences.

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Introduction

This user guide contains information about the Extron® FOX Tx/Rx AV family of signal transmitters and receivers, with information on how to install and operate these units.

In this guide, unless otherwise specified, the terms "FOX Tx/Rx AV" and "FOX AV" refer to the features or operation of all four units. The terms "FOX Tx AV" and "transmitter" refer to both the multimode (MM) and singlemode (SM) transmitters and "FOX Rx AV" or "receiver" refer to both the MM and SM receivers.

About the FOX Tx/Rx AV

The FOX Tx AV and FOX Rx AV are a high performance, low resolution video, audio, and data (RS-232) transmitter (Tx) and receiver (Rx) pairs. Signals are transmitted over fiber optic cable at rates up to 2 Gbps.

There are four different units:

- FOX Tx AV MM (multimode transmitter)
- FOX Tx AV SM (singlemode transmitter)
- FOX Rx AV MM (multimode receiver)
- FOX Rx AV SM (singlemode receiver)

The MM models have 850 nm multimode small form-factor pluggable (SFP) modules and carry signals up to 2 km (6562 feet). The SM models have 1310 nm singlemode SFP modules and carry signals up to 30 km (18.6 miles). The transmitter is connected to the receiver using the appropriate fiber optic cable (SM or MM).

WARNING: The FOX Tx/Rx AV outputs continuous invisible light (Class 1 rated), which may be harmful and dangerous to the eyes; use with caution.

Do not look into the rear panel fiber optic cable connectors or into the fiber optic cables themselves.

NOTES: The transmitter and receiver must be compatible. Both must be MM or both must be SM. It is not possible to mix types.

Plug the attached dust caps into the optical transceivers when the fiber optic cable is unplugged.

FOX Tx/Rx AV Features

The FOX Tx/Rx AV video units are compatible with the Extron Fiber Matrix units. However, they are not compatible with the following Extron products:

- FOXBOX
- FOX 500 (RGB) and FOX 500 DVI
- FOX 500 DA6
- FOX 3G HD-SDI

Digitized signal transmission — Ensures perfect image quality. The non-linearity of the fiber components does not affect signal quality. Light can be distributed and repeated without signal degradation or compression.

All digital, zero compression technology — The FOX AV delivers uncompressed pixel-for-pixel transmission of video signals to ensure optimal image quality.

Transmits multiple signal types — Video, audio and data signals can all be transmitted simultaneously over one fiber. The units transmit composite, S-Video, or component video signals and are compatible with NTSC, PAL, and SECAM standards.

Auto Input Format Detection — The FOX AV transmitter can be set to detect the incoming video signal format, automatically reconfiguring itself to transmit the signal. This feature can reduce the number of required outputs for a matrix switcher, lowering system cost while improving manageability.

Encoding and decoding — The FOX Tx AV converts incoming signals to a proprietary format that is passed along the fiber optic cable to the FOX Rx AV. At the other end of the cable, the receiver converts the signal to the low resolution format that matches the needs of the display device.

Output Video Formatting — The user can set the output video signal format (composite, S-Video, or component) or follow the format of the source device (video follow).

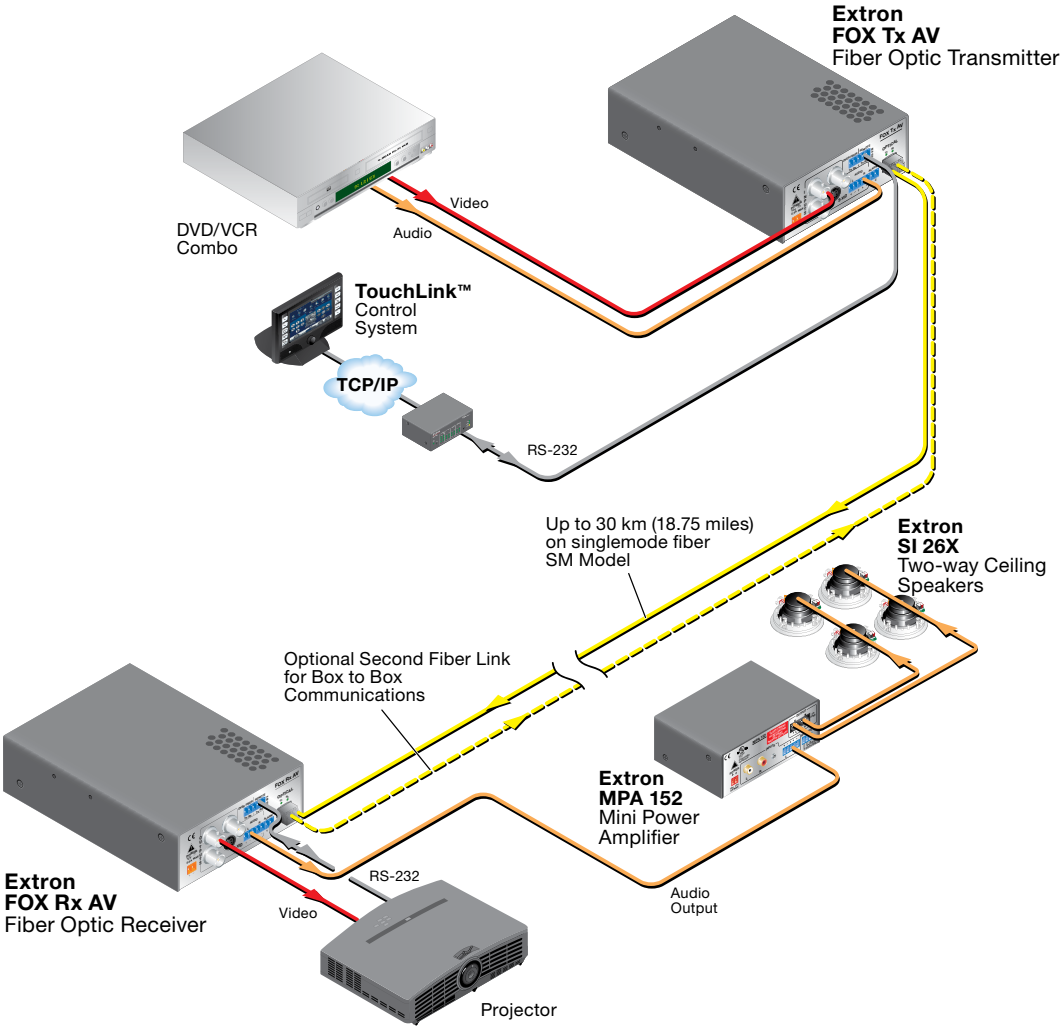


Figure 1. Typical Application for the FOX Tx/Rx AV

Picture and audio adjustments — Available picture adjustments include color, tint, contrast, and brightness. Audio adjustments include input gain and attenuation, and output level. Both audio and video can be muted.

Daisy chain capability — The system can be expanded to provide output for up to ten display devices.

Long distance transmission — Signals may be transmitted up to 2 km (6562 feet) over multimode fiber (see **Operating distance** Specs on page 24) or up to 30 km (18.6 miles) over singlemode fiber.

Integration friendly — A variety of connectors permits input and output of composite, S-video, or component video signals. Compatibility with Extron Fiber Matrix products allows these units to be integrated into more complex A/V systems.

Troubleshooting features — LED signals and indicators allow easy diagnosis of problems.

Easy configuration — The units can be configured using the Extron Special Instruction Set (SIS™) or the FOX Extender Control Program.

Panel Features and Connections

This section of the user guide describes:

- **Front panel features**
- **Rear panel features and connections**

FOX Tx/Rx AV Front Panel Features

Figure 2 shows the front panel features of the FOX Rx AV. The FOX Tx AV is identical except that the Follow LED is replaced by Auto (②) and it does not have a Loop-out LED (④).

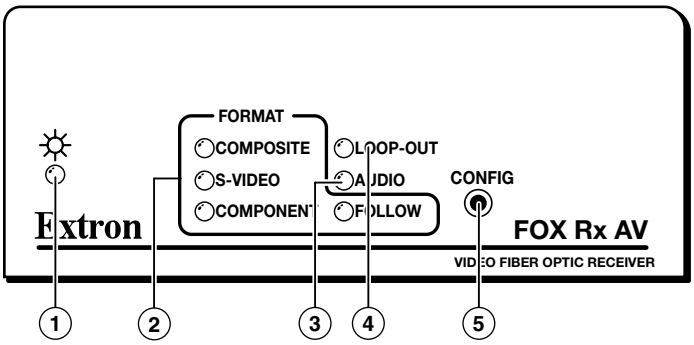


Figure 2. FOX Rx AV Front Panel Features

① **Power LED —** Lights green when the unit is receiving power.

② **Video Format LEDs —** These lights show signal presence and type. The receiver indicates Composite, S-Video, Component, and Follow. The transmitter indicates Composite, S-Video, Component, and Auto.

③ **Audio LED —** Lights when the transmitter detects an audio signal at or above 35 dB below the nominal level. It stays on until the signal falls below this threshold continuously for 10 seconds.

④ **Loop-Out LED —** This LED is only on the receiver and indicates that the unit is in the Daisy Chain mode.

⑤ **Config Port —** This 2.5 mm mini jack connector is an alternative to the rear panel RS-232 connections for configuring the units, using **SIS commands** (see page 13) or the **FOX Extender Control Program** (see page 19).

FOX Tx/Rx AV Rear Panel Connections

Figure 3 (below) shows the rear panel features of the FOX Tx AV. The FOX Rx AV rear panel is identical.

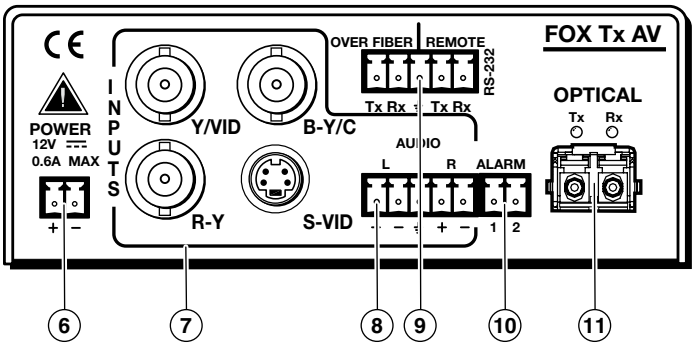


Figure 3. FOX Tx AV Rear Panel Features

⑥ **Power input —** This 3.5 mm, 2-pole captive screw connector accepts 12 VDC from an external power supply (provided).

> **NOTE:** The FOX Tx/Rx AV does not have a remote powering feature. Both the transmitter and the receiver require their own separate power supply.

1. Connect the captive screw connector from the power supply to the power receptacle.

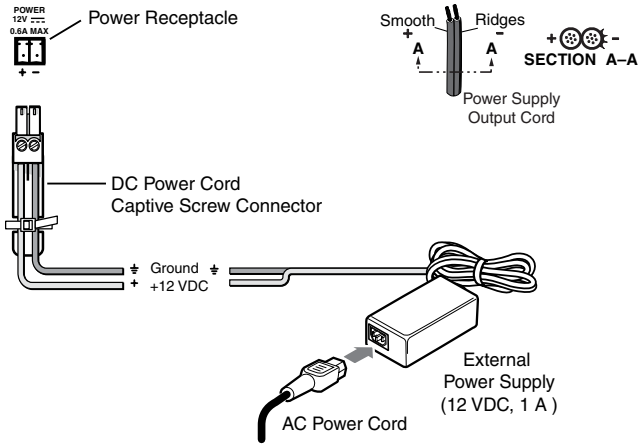


Figure 4. Power Input

> **CAUTION:** Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply, the transmitter, the receiver, or all three. Identify the ground (⏚) lead by the ridges on the side of the cord (see the figure above).

> **NOTE:** The ideal length of exposed wire in the stripping process is 3/16 inch (5 mm). If longer than 3/16 inch, the exposed wires may touch, causing a short circuit. If shorter than 3/16 inch, the wires can be easily pulled out even if tightly fastened.
>
> Do not tin the wires. Tinned wire does not hold its shape and comes loose over time.

> **CAUTION:** Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
>
> Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The power supply is to be located within the same vicinity as the Extron A/V processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium or desk.
>
> The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.

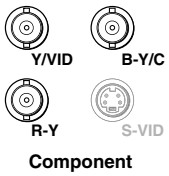
2. Connect the AC power cord of the power supply unit to a 110 or 220 VAC electrical source.
3. When the transmitter or receiver is getting power, the front panel LED shows an amber light.

⑦ **Video connections —** Three BNC connectors and one 4-pin mini DIN S-video connector for video input and output.

The FOX Tx/Rx AV accepts a single low resolution video signal (composite, S-video and low resolution component video) and outputs a single low resolution video signal (composite, S-video and low resolution component video). It is not compatible with RGB or HDTV 480p, 720p, or 1080i component video signals.

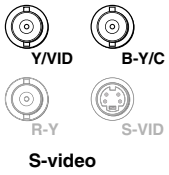
The transmitter converts incoming signals to a proprietary format and passes them along the fiber optic cable to the FOX Rx AV. The receiver converts the signal to a format that matches the display requirements. SIS commands are used to configure the receiver to convert between signal formats (see page 19).

To input a low resolution component signal, or output a component output signal, connect three BNC male connectors to the Y/VID, B-Y/C, and R-Y receptacles on the back panel of the unit as shown in the figure at right.

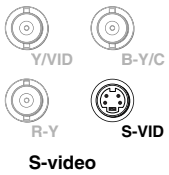


There are two alternative methods to input or output an S-video signal:

- Connect BNC male connectors to the Y/VID and B-Y/C receptacles on the back panel of the unit

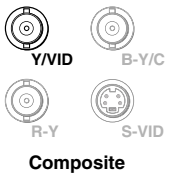


- Connect a 4-pin mini DIN to the S-VID receptacle on the back panel of the unit.



> **NOTE:** When a signal is output using BNC connectors, an additional transcoded S-video signal is always output from the S-VID socket of the receiver.

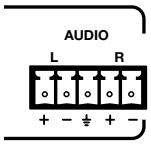
To input or output a composite signal, use a single BNC male connector to the Y/VID receptacle on the back panel of the unit.



When both the BNC connectors and the 4-pin mini DIN provide simultaneous video input, the signal with the highest priority for video output is highlighted in blue in the table below:

BNC Input	Mini DIN Input
Component	S-Video
S-Video	S-Video
Composite	S-Video

⑧ **Audio connections —** A 3.5 mm, 5-pole captive screw connector for audio input and output (see the figure at right). Input and output can be mono or stereo and can be balanced or unbalanced, depending on the wiring connections (see figure 5).



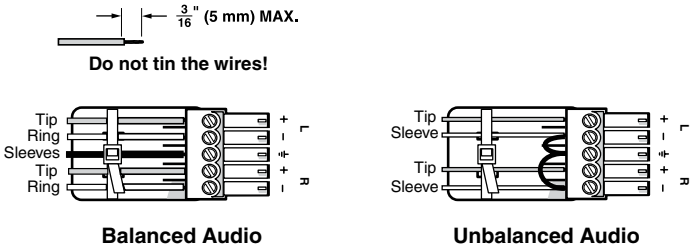


Figure 5. Audio Connections

See the **note** on page 5 for important information about preparing and connecting wires to captive screw connectors.

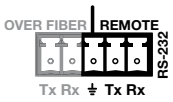
The table below shows the initial gain differences between audio input/output connectors, using captive screw connectors. The unbalanced output from the captive screw connector is half (-6 dB), regardless of input.

Input	Output	Gain
Balanced	Balanced	0 dB (unity)
Balanced	Unbalanced	-6 dB (half)
Unbalanced	Balanced	0 dB
Unbalanced	Unbalanced	-6 dB

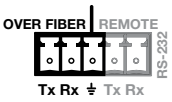
Additional adjustment of audio gain or attenuation can be made using **SIS commands** (see page 13).

NOTE: The Audio LED lights up immediately when the transmitter detects an audio signal 35 dB below the nominal level. It remains lit until the audio signal drops below that threshold continuously for 10 seconds.

⑨ **RS-232 connections —** The Remote RS-232 connections (see the figure at right) allow the transmitter and receiver units to be configured using SIS commands (see page) or the FOX Extender Control Program (see page 13).



The Over Fiber RS-232 connections (see the figure at right) allow pass-through to remote units.



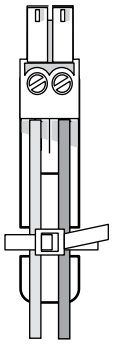
For more information see **RS-232 Ports** on page 12.

NOTE: Over fiber RS-232 communications are via a passive pass-through only; the FOX Tx/Rx AV units neither generate nor respond to these signals.

⑩ **Alarm —** When connected to an alarm, this 3.5 mm 2-pole captive screw connector gives a warning when light signals have been disconnected, lost, or broken.

See the **note** on page 5 for important information about preparing and connecting wires to captive screw connectors.

The alarm pins, labeled 1 and 2, (see figure at right) on the rear panel of the FOX Tx/Rx AV act as a short when activated. They do not produce any discrete on or off voltage signals but act as an internal relay that either connect or disconnect an external alarm circuit.

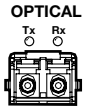


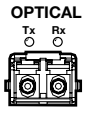
For the FOX Tx AV, the alarm state is activated when link 2 is absent. For the FOX Rx AV, the alarm state is activated when link 1 is absent.

When power is lost, the alarm state is activated for both units.

⑪ **Fiber Optic Cable connector —** An LC duplex SFP connector links the transmitter and receiver. An LED above each port lights when a signal is received. The optical Rx port of the receiver lights when a signal from fiber link 1 reaches the receiver. The optical Rx port or the transmitter lights when a signal from link 2 reaches the transmitter.

FOX Tx AV





FOX Rx AV

WARNING: The FOX Tx/Rx AV outputs continuous invisible light (Class 1 rated), which may be harmful and dangerous to the eyes; use with caution. **Do not look** into the rear panel fiber optic cable connectors or into the fiber optic cables themselves. Plug the attached dust caps into the optical transceivers when the fiber optic cable is unplugged.

Link 1 connects the Tx port of the transmitter and the Rx port of the receiver. It carries video, audio and/or data output from the transmitter to the receiver.

Link 2 is optional. It connects the Tx port of the receiver with the Rx port of the transmitter. It only carries the responses to RS-232 commands and is not required for transmitting video and audio signals.

However, if link 2 is not enabled, the ability to configure the system through SIS commands is limited by the lack of communication from the receiver to the transmitter. All commands issued through the transmitter are valid but responses to status queries may return invalid data.

Signals may be transmitted 2 km (6561 feet) over multimode (MM) fiber and 30 km (18 miles) over singlemode fiber (see **Operating distance Specs** on page 24). An MM transmitter must always be connected to a MM receiver and an SM transmitter can only be connected to a SM receiver.

Daisy Chain Capability

FOX Rx AV receivers have a loop-out mode that allows a signal to be passed along a daisy chain of to up to ten receivers, with a display device attached to each receiver. The loop-out mode is set using RS-232 commands (see **SIS Commands** on page 13).

All receivers in the daisy chain must be compatible, that is they must all be SM or all be MM models, connected with the appropriate fiber optic cable. Each receiver receives a signal at its Rx fiber optic port and passes the signal to the next unit through its Tx port.

NOTES: In daisy chain mode, the Tx port passes audio and video signals to the next receiver in the daisy chain. As a result, the Tx port is not available for bidirectional communication and system configuration with SIS commands is limited.

When multiple receivers are in daisy chain mode, RS-232 commands issued through the transmitter pass to every receiver but commands issued through a receiver apply only to that receiver. Configuring each receiver independently, matches each output signal to the unique needs of the display device.

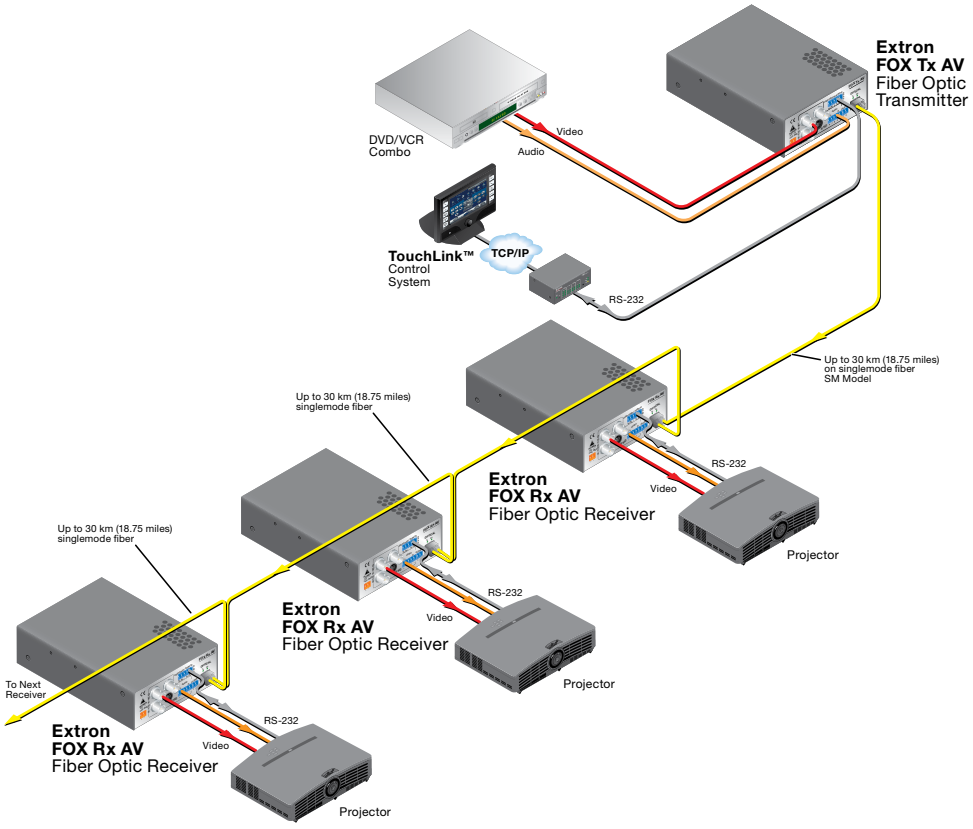


Figure 6. FOX Rx AV in Daisychain Mode

Configuration

This section of the user guide provides information about:

- **RS-232 Ports**
- **RS-232 Control of Tx and Rx Units**
- **SIS Commands**
- **Control Program**

RS-232 Ports

Both the FOX Tx AV and FOX Rx AV have a front panel TRS port and a rear panel captive screw port, which can provide SIS commands to configure the transmitter/receiver settings when connected to a control device.

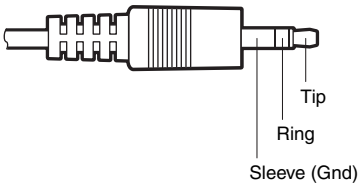
SIS commands for the FOX Tx/Rx AV start on page 13.

NOTE: The two comm ports work in parallel. However, depending on the computer or the communication settings, connecting to both comm ports at once may result in one or both ports not working. Extron recommends that only one comm port (front or back) is used at a time.

The protocol for both ports is 9600 baud, no parity, 8 data bits, 1 stop bit, and no flow control.

NOTE: Both RS-232 Remote and RS-232 Over Fiber signals require fiber optic link 1 and link 2 for **full functionality** (see page 12).

The front panel Config port uses a 2.5 mm mini jack connector. Extron recommends the 9-pin D Female to 2.5 mm TRS Configuration Cable (part number **70-335-01**)



2.5 mm TRS connector

Pin	TRS	Function
T_x	Tip	Transmit data
R_x	Ring	Receive data
⏚	Sleeve	Signal ground

Figure 7. Front Panel RS-232 Port

As an alternative to the front panel TRS port, the RS-232 Remote port, on the rear panel, uses three connectors in a 5-pole captive screw connector.

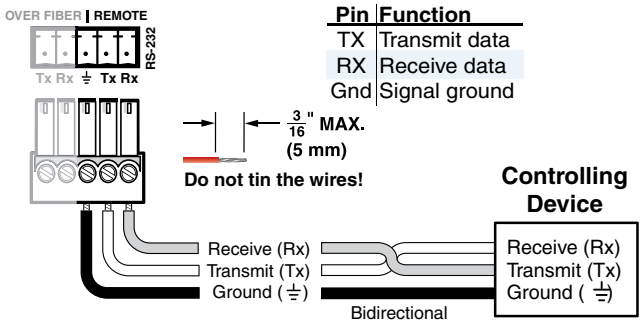


Figure 8. Rear Panel RS-232 Remote Port

In addition, on the rear panel, the units have RS-232 Over Fiber pass-through ports. These ports allow RS-232 commands to be passed from the control device to remote devices over the fiber optic cable with speeds up to 115 kbps.

NOTE: The FOX Tx/Rx AV does not respond to, or generate a response to, any commands passed through the "RS-232 Over Fiber" ports. Refer to the user guide of the device being controlled for the appropriate SIS commands.

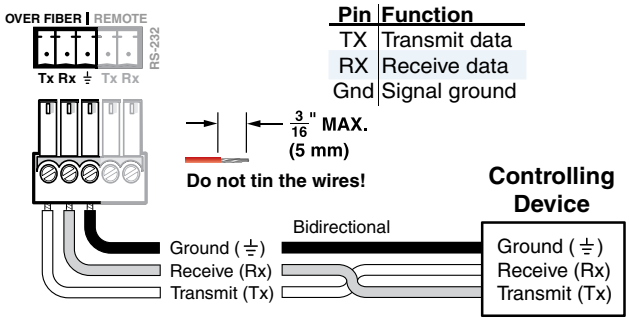


Figure 9. Captive Screw Connection for Rear Panel RS-232 Over Fiber Port

RS-232 Control of Tx and Rx Units

When the FOX Tx/Rx AV is configured by RS-232 commands, some commands are processed by the transmitter and others are processed by the receiver. The SIS commands do not distinguish between the two units. The system routes the commands based on where they are processed.

A system block diagram showing which functions are processed by the transmitter and which are processed by the receiver is shown below:

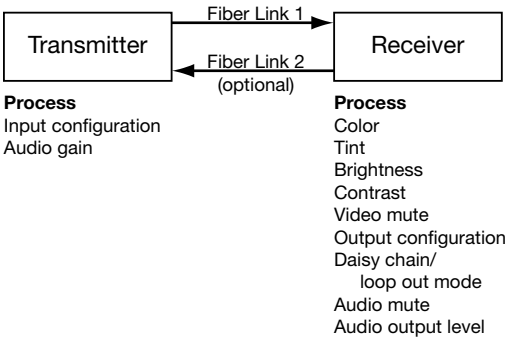


Figure 10. System Block Diagram

For full functionality, both fiber optic links must be enabled. If only link 1 is enabled, the ability to configure the system through SIS commands is limited by the lack of return communication from the receiver to the transmitter:

All configuration carried out using the transmitter is processed normally because only fiber link 1 is required.

Queries from the transmitter about the status of receiver settings are not processed correctly because fiber link 2 is required to carry the return signal.

The receiver cannot be used to configure the transmitter because fiber link 2 is required.

The lack of communication between the transmitter and the receiver can result in mismatches in the value settings of the two units, which may cause confusion with control systems or software applications. To avoid this, within four seconds of link 2 becoming active, the receiver settings are automatically copied to the transmitter to ensure settings for both units match.

NOTE: When the receiver settings are copied to the transmitter, existing transmitter settings are overwritten and it may be necessary to update those values.

SIS Commands

Introduction to SIS

SIS commands consist of a string (one or more characters per command field). Commands do not require any special characters to begin or end the command string. Each response from the unit ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string.

When the FOX Tx/Rx AV unit is first switched on, depending on the model, it sends one of the following messages:

`(c) Copyright 2008, Extron Electronics, FOX 2G Tx AV, Vx.xx, 60-941-11`↵ or

`(c) Copyright 2008, Extron Electronics, FOX 2G Tx AV, Vx.xx, 60-941-12`↵ or

`(c) Copyright 2008, Extron Electronics, FOX 2G Rx AV, Vx.xx, 60-941-21`↵ or

`(c) Copyright 2008, Extron Electronics, FOX 2G Rx AV, Vx.xx, 60-941-22`↵

where *`V x.xx`* is the firmware version number and `60-941-`*`xx`* is the catalog number.

Symbols Used in This Guide

When programming in the field, certain characters are most conveniently represented by the hexadecimal equivalent of their ASCII value. For convenience, the table below shows the hexadecimal equivalent of each ASCII command:

ASCII to HEX Conversion Table																															
Space	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27	(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37	8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47	H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57	X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67	h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77	x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Figure 11. ASCII to Hex Conversion Table

NOTE: Apart from G (gain) and g (attenuation), upper and lower case characters can be used interchangeably in SIS commands for this product. For example, either "C" or "c" can be used to **set the color value** (see page 15).

The symbols (Xn values) defined in this section are the variables used in the fields of the **command and response table** that begins on page 15.

↵ — carriage return with line feed

← — carriage return (no line feed)

• — space character

Esc — Escape key

X1 — Input video type

0 = Auto
4 = Component
5 = S-video
6 = Composite

X2 — Color, tint, contrast, or brightness adjustment (0 to 127)

X3 — Auto Memory, blanking, or audio mute status

0 = disabled
1 = enabled

X4 — Output video type

0 = Follow input type
6 = Component
7 = S-video
8 = Composite

X5 — Audio gain (0 to +10 dB)

X6 — Audio attenuation (-18 to 0 dB)

X7 — Audio level (-18 to +10 dB)

X8 — Audio output level

0 = Consumer level (-10 dBV) (default)
1 = Professional level (+4 dBu)

X9 — Test pattern

0 = Test pattern off
1 = Color bars
2 = Grayscale
3 = Alternating pixels

X10 — Link #2 transmission status

0 = disables link #2
1 = enables link #2 from receiver back to transmitter
2 = enables daisy chain mode on receiver

X11 — SM (singlemode) or MM (multimode)

X12 — Tx (transmitter) or Rx (receiver)

X13 — Memory presets (1 to 30)

X14 — Internal temperature in degrees Fahrenheit and Celsius: (xxxF xxC)

Error messages

E10 — Invalid command

E13 — Invalid parameter

E14 — Not valid for this configuration

Command and Response Table for SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Input video format			
Specify input setting	X1\	TypX1↵	Sets format of input video signal (X1) 0 = Auto 4 = Component 5 = S-Video 6 = Composite
View current input setting	\	X1↵	Displays current input video format.
Adjust color			
Specify color value	X2C	ColX2↵	Sets color value for video signal (X2 from 0 to 127).
Increment color value	+C	ColX2↵	Increases color value by 1.
Decrement color value	-C	ColX2↵	Decreases color value by 1.
View current color value	C	X2↵	Displays current color value.
Adjust tint			
Specify tint value	X2T	TinX2↵	Sets tint value for video signal (X2 from 0 to 127).
Increment tint value	+T	TinX2↵	Increases tint value by 1.
Decrement tint value	-T	TinX2↵	Decreases tint value by 1.
View current tint value	T	X2↵	Displays current tint value.
Adjust contrast			
Specify contrast value	X2^	ConX2↵	Sets contrast value for video signal (X2 from 0 to 127).
Increment contrast value	+^	ConX2↵	Increases contrast value by 1.
Decrement contrast value	-^	ConX2↵	Decreases contrast value by 1.
View current contrast value	^	X2↵	Displays current contrast value.
Adjust brightness			
Specify brightness value	X2Y	BrtX2↵	Sets brightness value for video signal (X2 from 0 to 127).
Increment brightness value	+Y	BrtX2↵	Increases brightness value by 1.
Decrement brightness value	-Y	BrtX2↵	Decreases brightness value by 1.
View current brightness value	Y	X2↵	Displays current brightness value.
Video mute			
Enable blanking	1B	Blk1↵	Blanks selected input (X3). 0 = Disables blanking or mute. 1 = Enables blanking or mute.
Disable blanking	0B	Blk0↵	Displays selected input.
View current blanking status	B	X3↵	Displays current blanking status.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Output video format			
Specify output setting	6*X4#	SynX4↵	Sets format of output video signal (X4). 0 = Follow input type 6 = Component 7 = S-Video 8 = Composite
View current output setting	6#	X4↵	Displays current output video format
Memory Presets			
Recall Preset	X13.	RprX13↵	A period (.) follows X13 in the command. Recalls memory preset (X13) from 1 to 30.
Save Preset	X13,	SprX13↵	A comma (,) follows X13 in the command. Saves memory preset (X13).
Audio mute			
Enable audio mute	1Z	Amt1↵	Mutes audio (X3). 0 = Disables audio mute. 1 = Enables audio mute.
Disable audio mute	0Z	Amt0↵	Un-mutes audio.
View current audio mute status	Z	X3↵	Displays current audio mute status.
Audio gain and attenuation			
Specify gain value	X5G	AudX5↵	Sets value of audio gain. **Upper case "G" only for configuring gain** (X5 from 0 to 10 dB).
Specify attenuation value	X6g	AudX6↵	Sets value of audio attenuation. **Lower case "g" only for configuring attenuation** (X6 from 0 to -18 dB).
Increment audio level	+G +g	AudX7↵ AudX7↵	Increases gain (G) or attenuation (g) by 1 dB. Audio level adjustment range (X7 from -18 to +10 dB).
Decrement audio level	-G -g	AudX7↵ AudX7↵	Decreases gain (G) or attenuation (g) by 1 dB.
View current audio level	G g	AudX7↵ AudX7↵	Displays current value for gain (G) or attenuation (g).

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Audio output level			
Set to consumer level	40*0#	Lvl0	Sets audio output to consumer level (X8). 0 = Consumer level (-10 dBV) — default. 1 = Professional level (+4 dBu).
Set to professional level	40*1#	Lvl1	Sets audio output to professional level.
View current output level status	40#	X8↵	Displays current audio output level.
Auto Memory			
Disable Auto Memory	55*0#	Img0↵	Disables Auto Memory.
Enable Auto Memory	55*1#	Img1↵	Enables Auto Memory.
View current Auto Memory setting	55#	X3↵	View the current Auto Memory setting (X3) 0 = disabled; 1 = enabled.
Auto Image			
Trigger	55*2#	Img↵	Returns video adjustments (color, contrast, tint, and brightness) to default values (64).
Test Pattern			
Color bars	1J	Tst1↵	Sets color bars test pattern on (X9). 0 = test pattern off 1 = color bars 2 = grayscale 3 = alternating pixels
Grayscale	2J	Tst2↵	Sets grayscale test pattern on.
Alternating pixels	3J	Tst3↵	Sets alternating pixels test pattern on.
Off	0J	Tst0↵	Sets test pattern off.
View current test pattern status	J	X9↵	Displays current test pattern status.
Link #2 Transmission			
Disable	66*0*0#	Rle*0*0↵	Disables link #2. Link #2 status (X10): 0 = disables link #2 (receiver to transmitter). 1 = enables link #2. 2 = enables receiver daisy chain mode.
Enable	66*0*1#	Rle*0*1↵	Enables link #2.
Daisy chain	66*0*2#	Rle*0*2↵	Enables receiver daisy chain mode.
View current link #2 status	66*0#	0*X10↵	Displays current link #2 status. This command is only available on the reciever unit; the transmitter responds with an E14 error code.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Information Request			
General information	I	1Link[X3]•2Link[X3] •Vid[X3]•Aud[X3] •[X11]•[X12]↵	[X3] Link #1: active signal present (1) or absent (0) • [X3] Link #2: active signal present (1) or absent (0) • [X3] video output signal enabled (1) or disabled (0) • [X3] audio signal enabled (1) or disabled (0) • [X11] SM or MM • [X12] Tx or Rx
Query firmware (F/W) version	Q	x.xx↵	Displays current F/W version.
Query all F/W versions	0Q	x.xx-x.xx-x.xx-x.xx↵	Diplays information about all F/W versions.
Query Factory F/W version	32Q	x.xx↵	Displays factory loaded F/W version.
Query updated F/W version	34Q	x.xx↵	Displays updated F/W version.
Query factory FPGA version	33Q	x.xx↵	Displays factory loaded Field Programable Gate Array (FPGA) version.
Query updated FPGA version	35Q	x.xx↵	Displays updated FPGA version.
Query part number	N	60-941-zz↵	Displays the unit's part number.
Query other unit part number	1N	60-941-zz↵	Displays the part number of other connected box.
Status Request			
View link 1 Status	1S	[X3]↵	Displays link 1 status ([X3]) 0 = active signal absent 1 = active signal present
View link 2 Status	2S	[X3]↵	Displays link 2 status
View input video status	3S	[X3]↵	Displays input video status
View input audio status	4S	[X3]↵	Displays input audio status
View internal temperature	20S	[X14]↵	Displays internal temperature in degrees F
Factory Defaults			
System Reset (factory default)	[Esc]ZXXX←	Zpx↵	Resets unit to all factory default values
Reset audio settings	[Esc]ZA←	Zpa↵	Resets all audio settings to factory default values
Reset presets	[Esc]ZG←	Zpg↵	Rests all memory presets to factory default values

SIS Command Validity Table

If only one fiber optic channel is enabled, the ability to configure the system through SIS commands is limited by the lack of return communication from the receiver to the transmitter.

All commands issued through the transmitter are valid because link 1 allows signals to be forwarded to the receiver. However, responses to queries originating from the transmitter about the status of the receiver return invalid data.

All configuration of the receiver by commands issued through the receiver is valid. Attempts to configure the the transmitter through the receiver in the absence of link 2 are invalid.

The following table shows the validity of commands issued through the receiver when only link 1 is active:

Adjustment	
Color	Valid
Tint	Valid
Brightness	Valid
Contrast	Valid
Audio gain/attenuation	**Invalid**
Audio mute	Valid
Audio output level	Valid
Output configuration	Valid
Input configuration	**Invalid**
Daisy chain mode	Valid
Test pattern	Valid
Video mute	Valid

Control Program

The Extron FOX Extender Control Program communicates with the transmitter and receiver pair via the rear panel Remote RS-232 port or front panel configuration port of either unit.

The program is compatible with Windows® 2000, Windows XP and later versions of Windows. Upgrades to the control program can be downloaded from the Extron Website (**www.extron.com**).

Installing the Software

Insert the disc provided into the DVD-ROM drive of the computer. If the setup program does not start automatically, run **`Launch.exe`** from the DVD-ROM directory in Windows `My Computer`. Select the Software tab, locate the FOX Extender Windows Control Program and click **`Install`**. Follow the on screen instructions.

By default, the Installer program creates a `C:\Program Files\Extron\Fox_Extenders` folder, containing the FOX Extender control program. An icon may also be placed on the Windows desktop.

Starting the Program

Start the Extron FOX Extender control program as follows:

1. Set up and power on the units as described in **Power Input** on page 5. Connect the PC to one of the **control ports** on either the transmitter or receiver (see page 10).
2. Click **`Start > All Programs > Extron Electronics > FOX Extender WCP > FOX Extender WCP`** or click on the desktop icon (see icon at right). The **Communication Setup** window opens:

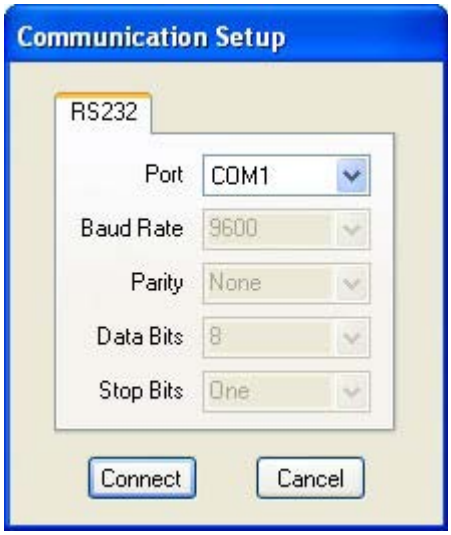


Figure 12. Communication Setup Window

3. Select the Com port to which your transmitter or receiver is connected and click **`Connect`**. The **Communication Setup** window closes and the **FOX Extender Windows Control Program** window opens (see figure 13 below).

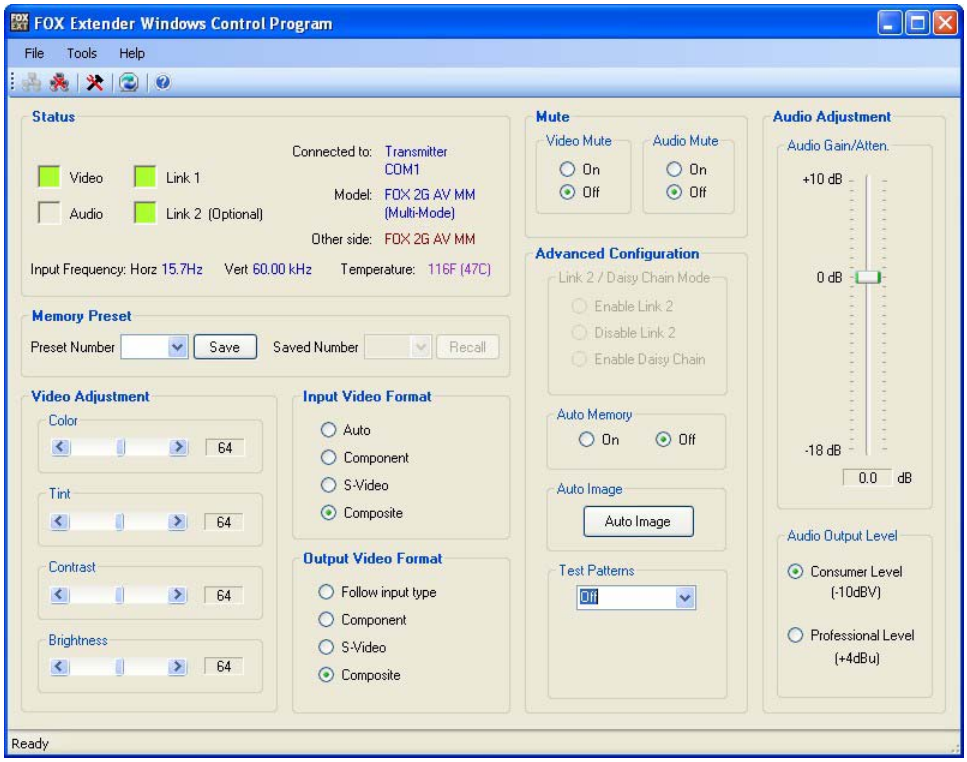


Figure 13. FOX Extender Windows Control Program Window

Status area

The Status area provides visual indications of the connection status:

Figure 14. Status Area

> **NOTE:** Only link 1, connecting the Tx port of the transmitter to the Rx port of the receiver, is required for video, audio, and serial command transmission. Link 2 is not required but, if it is not enabled, the ability to configure the system is limited by a lack of communication from the receiver to the transmitter.

Video present indicator — Shows green to indicate the presence of composite, S-video, or component video signals.

Audio present indicator — Shows green when the transmitter detects an audio signal at or more than 35 dB below the nominal level. Stays on until the signal falls below this threshold continuously for 10 seconds.

Loop-out indicator — Only visible if the computer is connected to the receiver.

Link 1 indicator — Shows green when the receiver detects light on link 1 (connecting the Tx port of the transmitter to the Rx port of the receiver). The receiver reports the status to the transmitter over link 2.

> **NOTE:** If the computer is connected to either of the transmitter's control ports and link 2 is disconnected, the link 1 indicator does not show green because, when the receiver detects light on link 1, it is not be able to pass that information to the transmitter.

Link 2 (Optional) indicator — Shows green when the transmitter detects light on link 2 (connecting the Tx port of the receiver to the Rx port of the transmitter). The transmitter reports the status to the receiver via link 1.

The status area also shows the unit type (the transmitter or receiver) and model description for the unit to which the computer is connected, the unit at the other end of the fiber optic cable and the COM port on the computer that is connected to the unit.

It also provides information about the horizontal and vertical frequencies of the input signal and the internal temperature.

Memory Preset area

The Memory Preset area provides tools to save and recall memory presets:

Figure 15. Memory Preset Area

Select a Preset Number from the dropdown menu and click **Save**. The current values of color, tint, contrast, and brightness are saved as a Memory Preset. Previously saved memory presets can be called by selecting a Saved Number from the dropdown menu and clicking on **Recall**.

Mute area

Select either the **On** or **Off** radio buttons in the **Mute** area to mute or unmute the video and audio signals.

Video Adjustment area

Use the sliders to adjustment the color, tint, contrast, and brightness of the picture that is displayed. All four of these variables can be adjusted between 0 and 127, with the current value displayed in the text box to the right of the corresponding slider.

Video Format area

Clicking the radio buttons in the Video Format area selects the input format (**Auto**, **Component**, **S-video**, or **Composite**) and output format (**Follow input type**, **Component**, **S-video**, or **Composite**).

NOTE: The transmitter converts the input signal into a proprietary signal type, which passes through link 1 to the receiver. The receiver converts the signal back to the required signal type. This allows the input signal to be transcoded to meet the requirements of the output device.

When there are two video sources, S-video through the 4-pin mini DIN and another format through the BNC connectors, the choice of button determines which input format is transmitted. When Auto is selected, the transmitter automatically detects the input format.

When follow input type is selected for the output format, the output signal is in the same format as the original input signal.

Advanced Configuration area

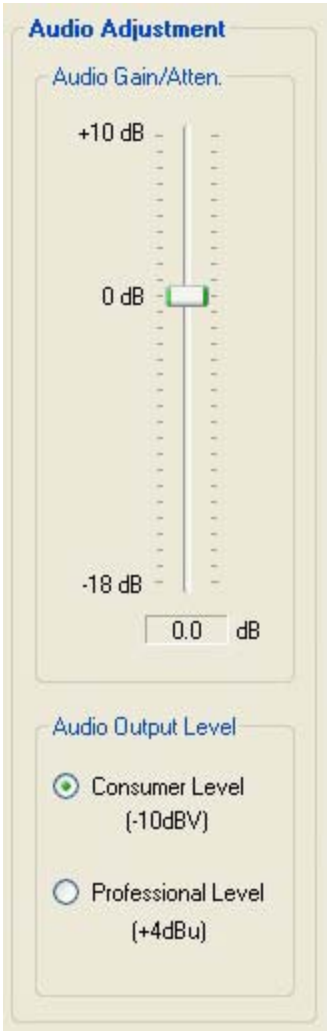
Link 2/Daisy Chain Mode — Provides radio buttons to choose the mode for the receiver's Tx port. If it is connected to the transmitter, the link may be enabled or disabled. Alternatively, the port may be connected to another receiver with the Daisy Chain mode enabled.

Auto Memory — May be switched on or off, using radio buttons. When Auto Memory is on, previously saved values such as color, tint, contrast, and brightness are applied whenever the vertical field rate of the input changes.

Auto Image — Returns the video adjustment settings of color, tint, contrast, and brightness back to their default values (64).

Test Patterns — Allow the user to select one of three built-in test patterns (color bars, grayscale, or alternating pixels), which help calibrate the display device. When Off is selected, the receiver outputs the video signal from the source device.

Audio Adjustment area



Audio Gain/Attenuation — Provides a click and drag slider control to select the input audio gain or attenuation value, from -18 dB to +10 dB in 1.0 dB increments.

> **NOTE:** The transmitter converts the input signal into a proprietary signal type, which passes through link 1 to the receiver. The receiver converts the signal back to the required signal type. This allows the input signal to be transcoded to meet the requirements of the output device.

Audio Output Level — Provides radio buttons to allow a choice between consumer level (-10 dBV) or professional level (+4 dBu) for the audio output.

Firmware for FOX Tx/Rx AV

Firmware can be downloaded onto the unit from the Extron website (**www.extron.com**).

> **CAUTION:** The transmitter and receiver require different firmware and must both be upgraded separately.

Specifications

NOTES: The FOX AV consists of a transmitter (FOX Tx AV) and a receiver (FOX Rx AV) with one or two fiber optic cables linking the two units.

The analog video input signal is digitized pixel for pixel in the transmitter, sent digitally through the fiber cable, and converted back to analog video in the receiver.

The analog audio signal(s) is (are) digitized in the transmitter, sent through the fiber cable, and converted back to analog audio in the receiver.

These transceivers are class 1 laser products. They meet the safety regulations of IEC-60825, FDA 21 CFR 1040.10, and FDA 21 CFR 1040.11.

Optical fiber interconnection between transmitter and receiver

Number/type ..... 1 or 2 fiber optic

NOTE: Only one fiber is required to transmit video, audio, and unidirectional data. A second fiber is required to transmit return data for bidirectional control/communication.

Connectors ..... 2 LC connectors

Operating distance

- Singlemode ..... 30 km (18.75 miles) with singlemode (SM) cables with a FOX AV SM
- Multimode..... 500 m (1640') with 62.5 µm multimode (MM) cables with a FOX AV MM
  1 km (3280') with 50 µm multimode cables with a FOX AV MM
  2 km (6561') with 50 µm, 2000 MHz bandwidth laser optimized multimode cables with a FOX AV MM

NOTE: Operating distance is approximate. These are typical maximum distances that may vary depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.

Data rate..... 2.125 Gbps

Transmission power

- Singlemode ..... -5 dBm, typical
- Multimode..... -5 dBm, typical

Maximum receiver sensitivity

- Singlemode ..... -18 dBm, typical
- Multimode..... -12 dBm, typical

Optical loss budget

- Singlemode ..... 13 dB, maximum
- Multimode..... 7 dB, maximum

Video

Gain..... Unity

Standards

- Input ..... NTSC 3.58, NTSC 4.43, PAL, SECAM, autodetected
- Output ..... NTSC 3.58, PAL (follows vertical rate)

Decoder type..... Adaptive 2D, digital comb filter

Video input — transmitters

Number/signal type	1 component (Y, R-Y, B-Y), S-video, composite video
Connectors	1 x 3 female BNC or 1 female 4-pin mini DIN for S-video
Nominal level	1.0 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for R-Y, B-Y of component video 0.3 Vp-p for C of S-video
Minimum/maximum levels	Analog: 0.3 V to 1.5 Vp-p with no offset
Impedance	75 ohms
Return loss	-30 dB for Y/VID, B-Y/C, R-Y @ 5 MHz
Input coupling	AC

Video output — receivers

Number/signal type	1 component (Y, R-Y, B-Y) video, S-video, composite video
Connectors	1 x 3 female BNC or 1 female 4-pin mini DIN for S-video
Nominal level	1.0 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for R-Y, B-Y of component video 0.3 Vp-p for C of S-video
Minimum/maximum levels	0.3 V to 1.5 Vp-p
Impedance	75 ohms @ 5 MHz
Return loss	<-40 dB @ 5 MHz
DC offset	+350 mV, maximum, with input at 0 offset
Video delay	1-2 frames

Audio

Gain	
Range	Adjustable, -18 dB to +10 dB
Default	Unbalanced output: -6 dB; balanced output: 0 dB
Frequency response	20 Hz to 20 kHz, ±0.5 dB
THD + Noise	0.15% @ 1 kHz at nominal level
S/N	>80 dB at maximum output (unweighted)
CMRR	65 dB @ 20 Hz to 20 kHz
Audio bits per sample	18 bits per channel, 2 channels (L, R)
Sampling rate	48 kHz

Audio input — transmitter

Number/signal type	1 stereo, balanced/unbalanced or 2 mono, balanced/unbalanced
Connectors	(1) 3.5 mm captive screw connector, 5 pole
Impedance	>10k ohms unbalanced, >20k ohms balanced, DC coupled
Nominal level	+4 dBu (1.23 Vrms), -10 dBV (316 mVrms)
Maximum level	>+17 dBV, (unbalanced) at 1% THD+N

NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu

Audio output — receiver

Number/signal type	1 stereo, balanced/unbalanced or 2 mono, balanced/unbalanced
Connectors	(1) 3.5 mm captive screw connector, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Nominal level	+4 dBu (1.23 Vrms), -10 dBV (316 mVrms)
Maximum level (Hi-Z)	>+19 dBu, unbalanced at 1% THD+N
Maximum level (600 ohm)	>+15 dBm, unbalanced at 1% THD+N
Audio delay	1.5 frames

Control/remote

Serial control ports on each unit (transmitter and receiver)

Control	1 RS-232, 3.5 mm captive screw connector, 5 pole (3 pins are used) (rear panel); in parallel with front panel jack 1 RS-232, 2.5 mm mini stereo jack (front panel)
Pass-through	1 RS-232, 3.5 mm captive screw connector, 5 pole (3 pins are used) (rear panel)

Baud rate and protocol

Control	9600 baud, 8 data bits, 1 stop bit, no parity
Pass-through	9600 to 115200 baud

Serial control pin configurations

Pass-through	Captive screw connector: 1 = Tx, 2 = Rx, 3 = GND
Control	Captive screw connector: 3 = GND, 4 = Tx, 5 = Rx Mini stereo jack: tip = Tx, ring = Rx, sleeve = GND
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™)

General

External power supply	100 VAC to 240 VAC, 50-60 Hz, external; to 12 VDC, 1 A, regulated
Power input requirements	12 VDC, 0.6 A
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, vents on left side and top

Mounting

Rack mount	Yes, with optional rack shelf kit
Furniture mount	Yes, with optional under-desk mounting kit

Enclosure type	Metal
Enclosure dimensions	1.7" H x 4.3" W x 6.0" D (1U high, quarter rack wide) (4.3 cm H x 10.9 cm W x 15.2 cm D) (Depth excludes connectors.)
Product weight	0.8 lbs (0.4 kg) per unit, 1.6 lbs (0.7 kg) per pair
Shipping weight	3 lbs (2 kg) per unit, 6 lbs (3 kg) per pair
Vibration	ISTA 1A in carton (International Safe Transit Association)

Regulatory compliance

Safety	CE, CUL, FDA Class 1, UL
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI

MTBF	30,000 hours
Warranty	3 years parts and labor

NOTES: All nominal levels are at ±10%.

Specifications are subject to change without notice.

Reference Information

This section of the user guide provides information about:

- Included Parts
- Optional Accessories

Included Parts

Included parts	Replacement part number
(1) FOX Tx AV MM (transmitter)	60-941-11
or (1) FOX Tx AV SM (transmitter)	60-941-12
or (1) FOX Rx AV MM (receiver)	60-941-21
or (1) FOX Rx AV SM (receiver)	60-941-22
(1) 12 VDC Desktop power supply	
(1) IEC cord	
(1) MM or SM fiber patch cable	
(2) 5-pole 3.5 mm blue captive screw	
(1) 2-pole 3.5 mm blue captive screw	
(1) 2-pole 3.5 mm orange captive screw	
(4) Rubber feet (not attached)	
Setup Guide - FOX Tx/Rx AV	
Audio Connector Wiring Instruction Card	
Extron Software Products DVD	

Optional Accessories

Accessory	Part number
PMK 350	70-563-0x
PMK 200	70-077-04
RSU 129 1U, 9.5 inch rack shelf kit	60-190-01
RSB 129 1U, 9.5 inch rack shelf	60-604-02
RSU 126 1U, 6 inch rack shelf kit	60-190-10
RSB 126 1U, 6 inchs rack shelf	60-604-11
MBU 125 Under desk mounting kit	70-077-01
MBD 129 Through desk mounting kit	70-077-02
CSR 6 adapter	26-575-01
MHR-2 SV Series: Male to Male 4-pin Mini DIN S-video cables	26-316-0x
MHR-2P SVM-M: Male to Male 4-pin Mini DIN S-video cables (Plenum)	26-522-0x
MHR-5 BNC Series: BNC Male to Male five conductor MHR	26-260-0x
MHR-5P BNC Series: BNC Male to Male five conductor MHR (Plenum)	26-378-xx
RG6-5 BNC Series: BNC Male to Male five conductor RG6 Super High Res.	26-369-xx

Mounting

This section describes the mounting options for the FOX Tx/Rx AV

- **Tabletop Mounting**
- **Rack Mounting**
- **Under-desk Mounting**
- **Through-desk Mounting**
- **Above Projector Mounting**

Tabletop Mounting

Attach the four provided rubber feet to the bottom of the unit and place it in any convenient location.

Rack Mounting

Underwriters Laboratories Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

Elevated operating ambient temperature — If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (Tma: +122 °F, +45 °C) specified by Extron.

Reduced air flow — Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.

Mechanical loading — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.

Circuit overloading — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Give appropriate consideration to the equipment nameplate ratings when addressing this concern.

Reliable earthing (grounding) — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack Mounting the FOX Tx/Rx AV

The FOX Tx/Rx AV can be mounted a range of (optional) rack shelves (see **Optional Accessories** on page 28). To mount the units, follow the instructions provided with the rack mounting kit.

Under-desk Mounting

Mount the FOX Tx/Rx AV under furniture, using the optional Extron MBU 125 under-desk mounting kit (part number **70-077-01**). Follow the instructions provided with the kit.

Through-desk Mounting

Mount the FOX Tx/Rx AV under furniture, using the optional Extron MBD 129 through-desk mounting kit (part number **70-077-02**). Follow the instructions provided with the kit.

Above Projector Mounting

Mount the FOX Tx/Rx AV under furniture, using the optional Extron PMK 200 (part number **70-077-04**) or PMK 350 (part number **70-563-0x**) above projector mounting kits. Follow the instructions provided with the kit.

Extron® Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase; touchscreen display and overlay components are covered for 1 year. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe, Africa, and the Middle East:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or modifications made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: (714) 491-1500 **Europe**: +31.33.453.4040
Asia: +65.6383.4400 **Japan**: +81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron **USA - West** Headquarters	Extron **USA - East**	Extron **Europe**	Extron **Asia**	Extron **Japan**	Extron **China**	Extron **Middle East**
+800.633.9876 Inside USA/Canada Only	**+800.633.9876** Inside USA/Canada Only	**+800.3987.6673** Inside Europe Only	**+800.7339.8766** Inside Asia Only	**+81.3.3511.7655**	**+400.883.1568** Inside China Only	**+971.4.2991800**
+1.714.491.1500	**+1.919.863.1794**	**+31.33.453.4040**	**+65.6383.4400**	**+81.3.3511.7656** FAX	**+86.21.3760.1568**	**+971.4.2991880** FAX
+1.714.491.1517 FAX	**+1.919.863.1797** FAX	**+31.33.453.4050** FAX	**+65.6383.4664** FAX		**+86.21.3760.1566** FAX	

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